The Importance of Entrepreneurship on Economic Development. Evidence From the OECD Countries

Sara Proença[11] and Elias Soukiazis [2]
[1]Polytechnic Institute of Coimbra/ESAC, CERNAS, Bencanta, Coimbra, Portugal
[2]University of Coimbra, CeBER, Faculty of Economics, Coimbra, Portugal
sproenca@esac.pt
elias@fe.uc.pt

Abstract: The process of a country's economic growth and development is a very complex phenomenon, influenced by numerous factors, which has attracted the attention of researchers and policymakers over time. Several studies highlight the important role of entrepreneurship on economic growth, by introducing innovative technologies, creating new products, promoting new jobs and employment opportunities, but also improving competition and competitiveness. Although the impact of entrepreneurship on economic growth has been broadly analysed in the economic literature over the recent years, few studies have examined the impact of entrepreneurship on economic development. The aim of this paper is to fill this gap, using the Human Development Index (HDI) as a suitable proxy for measuring economic development, taken from the United Nations statistics. HDI is a composite measure of average achievement in key dimensions of human development, such as, life expectancy, education level and standards of living. On the other hand, Entrepreneurship is measured by Total Entrepreneurial Activity (TEA) taken from the Global Entrepreneurship Monitor, which expresses the percentage of population with age between 18 and 64, who are either a nascent entrepreneur or owner-manager of a new business. The empirical model is drawn from the endogenous growth theory, assuming that entrepreneurship and human capital skills are the key drivers of economic development, along with capital stock. The empirical analysis is based on unbalanced panel data regressions for a sample of 37 OECD countries using annual data for the period 2000-2018. Estimating a dynamic panel data model by using the GMM two-step system approach, we obtain evidence indicating the positive association between the development level and entrepreneurship, as well as the positive impact of human capital and capital stock on development. Our empirical results are in line with the endogenous growth theory approach, showing that entrepreneurship can be considered as an additional factor input in the countries' economic development pathway.

Keywords: entrepreneurship, economic development, human development index, panel data, dynamic regressions

1. Introduction

Identifying the factors explaining economic growth and development is always a challenging matter that attracted the attention of researchers and policymakers over time. While neoclassical theory (Solow, 1956, Swan, 1956) claims that physical capital and labor are the two most important sources of a nation's economic growth, the endogenous growth theory (Romer, 1986, Lucas, 1988, Barro, 2001) holds that investment in human capital, knowledge diffusion and technology are key drivers of economic growth and human development. More recent developments in growth theory highlight the importance of business activities in creating wealth and new labor opportunities. In this sense, entrepreneurship plays an important role in enhancing economic activity by introducing innovative technologies, creating new products and services, promoting new jobs and employment opportunities, but also by improving competition and competitiveness (Schumpeter, 1934, Baumol and Strom, 2007, Khyareh and Rostami, 2018). This view is supported by the findings of the World Economic Forum (2013) showing that rapidly growing entrepreneurship is an important source of innovation, productivity growth and employment, and therefore an important determinant of economic and social development.

Studies on the role of entrepreneurship in economic growth, generally measured by the gross domestic product (GDP) cover a wide range of fields and approaches (Stoica et al., 2020, Boudreaux et al., 2019, Audretsch, et al., 2015, Acs et al., 2012). However, there are few studies in the literature that investigate the impact of entrepreneurship on the country´s development level (see Neumann, 2020 for a recent review). In this regard, it should be noted that the terms "economic growth" and "economic development" reflect different views of economic improvement, and it is worth to point out some differences since our study focuses on the latter. Economic growth is a narrow term, that refers to the quantitative increase of wealth (increase of real output of goods and services) measured by the increase in GDP or per capita income. Economic development, in turn, is a wider concept that apart from growth of the national income it includes qualitative aspects of wealth, such as:

[1]Corresponding author: Sara Proença, Escola Superior Agrária do Instituto Politécnico de Coimbra, Bencanta, 3040-316 Coimbra, Portugal.

education, health, social equity, and environmental quality, reflecting the quality of living standards. It measures the quality of growth, and not its quantity alone, which is crucial for the human well-being.

This paper contributes to the growing literature by examining the empirical relationship between entrepreneurship and economic development (not growth), using the Human Development Index (HDI) as a suitable proxy for measuring economic development. HDI is a composite measure of average achievement in key dimensions of human development, such as: life expectancy at birth to measure health standards, education level measured by the adult literacy rate, and real GDP per capita to serve as a proxy for the resources needed for improving the standard of living. HDI thus looks not only at the GDP growth rate but also considers education, health, gender, and income parameters to measure human development of a country, reasons that motivated its choice as a proxy for measuring the level of economic development. Entrepreneurship, in turn, is measured by Total Entrepreneurial Activity (TEA) taken from the Global Entrepreneurship Monitor, which expresses the percentage of population with age between 18 and 64, who are either a nascent entrepreneur or owner-manager of a new business. The empirical analysis estimates a dynamic development model of 37 OECD countries using annual data for the period 2000-2018.

The remainder of the present paper is organized as follows. Section 2 briefly reviews the literature on the relationship between entrepreneurship and economic performance. Section 3 explains the research methodology, the empirical model, and descriptive statistics on the variables used in the empirical model. Section 4 presents and discusses the main findings of the empirical analysis. Section 5 sets out the main conclusions and policy implications.

2. Literature review

Over the last decades, many researchers have found empirical evidence supporting a positive relationship between entrepreneurship and economic growth. For example, Acs et al. (2012) in an empirical study of 18 countries observed that in addition to investments in R&D and human capital, entrepreneurial activity has a positive impact on growth. The authors point out that entrepreneurship is a mechanism that facilitates the spillover of knowledge and is, thus, conducive to economic growth. In the same line, Audretsch and Keilbach (2004) using data for German regions state that entrepreneurship capital (defined as the capacity for economic agents to generate new businesses) is a significant and important factor shaping economic output and productivity.

The relationship between entrepreneurship and economic performance was also examined by Bosma et al. (2018) for a sample of 25 European countries over the period 2003–2014. The authors found that productive entrepreneurship has a positive impact on economic growth and that institutional quality, financial stability, small government, and perceived skills to start a business are the most significant predictors of such productive entrepreneurship. Galindo and Méndez (2014), in turn, highlight a virtuous cycle between entrepreneurship, economic growth, and innovation, where the three factors have positive effects to each other.

A more recent study by Stoica et al. (2020) examines the potential effect on economic growth (measured as per capita GDP) of different types of entrepreneurship, in particular early-stage, opportunity-driven and necessity-driven entrepreneurship, and how this impact differs depending on the stage of economic growth of a country. Considering a sample of 22 European countries classified into two groups according to their stage of economic performance over the period 2002-2018, the authors provide empirical evidence that supports the positive impact of all forms of entrepreneurship on economic growth for the whole sample of European countries, with opportunity-driven entrepreneurship having a stronger impact in transition countries and necessity-driven entrepreneurship in innovation-driven countries. In the same line of research, Urbano and Aparicio (2016) used the Total Entrepreneurial Activity (TEA), opportunity TEA, and necessity TEA as three different types of entrepreneurship to test their impact on economic growth in 43 countries in the period from 2002 to 2012. The empirical results show that all types of entrepreneurial activities positively affect economic growth in all countries of the sample, but the positive effect of overall TEA is higher in OECD than in non-OECD countries.

Empirical evidence which supports the view that the impact of entrepreneurship on economic performance differs depending on the stage of economic growth of a country is also corroborated by other recent studies. Ivanović-Djukić et al. (2018), using data for 21 European countries, demonstrate that the positive impact of entrepreneurial activity on economic growth is higher in developed European countries than in developing

countries. Additionally, the authors show that the greatest effect on economic growth is high-growth expectation entrepreneurship, followed by opportunity entrepreneurship, while the smallest impact was made by necessity entrepreneurship. Doran et al. (2018), in turn, showed that entrepreneurial activity has a positive effect on GDP per capita in high income countries in contrast to the middle/low-income countries, where the impact is negative. Stel et al. (2005), considering a sample of 36 countries over the 1999-2003 period, found that the entrepreneurial activity rate (measured by nascent entrepreneurs and owner/managers of young businesses) has a negative effect in the poorer countries and positively affects the rich countries, and that this is related to lower human capital skills of entrepreneurs in poorer countries. Similarly, Valliere and Peterson (2009), found that entrepreneurship has a positive and significant impact on economic growth in developed countries but not in emerging countries. Additionally, Vivarelli (2013) argues that increasing survival or self-employed entrepreneurship can be counter-productive to economic performance in less developing countries.

The literature review highlights that while several studies have been investigated the role of entrepreneurship on economic growth, generally measured in terms of gross domestic product (GDP), there is a lack of studies examining the relationship between entrepreneurship, educational level, and human development. Therefore, the present study builds on the existing literature by providing empirical evidence on the impact of entrepreneurship on the country´s development level measured by the human development index (HDI).

3. Model, data and methodology

To carry out the analysis of the relationship between entrepreneurship and economic development, this study develops an econometric model that presents some particularities. In contrast to the conventional growth theory, the dependent variable indicates the country´s development level which is explained by the standard factor inputs represented by the capital stock and human capital to be consistent with the endogenous growth theory (Romer, 1986, 1994) which predicts that the driving force of economic growth depends on internal factors such as investment in human capital, innovation, and knowledge creation. Entrepreneurship is an additional covariate testing its importance on the development level. A lagged dependent variable is used to verify whether past development levels are important for explaining current levels, and this specification is consistent with the partial adjustment mechanism that allows to distinguish the short-run and long-run effects of factor inputs, as well as the speed of adjustment of the actual variation of the development level to its optimal level. The empirical model to estimate assumes the following form:

$$lnHDI_{it} = \alpha_i + \beta_1 lnHDI_{it-1} + \beta_2 TEA_{it} + \beta_3 lnKpc_{it} + \beta_4 lnHK_{it} + u_{it} \quad \text{Eq. (1)}$$

where, i is the country index and t denotes the time period. The dependent variable (HDI_{it}) is expressed by the human development index taken from the United Nations, which is a composite measure of average achievement in key dimensions of human development, such as life expectancy, education level and income. Among the explanatory variables, entrepreneurship is of particular interest, expressed by the total entrepreneurial activity, and measured by the proportion of the population between 18 and 64 years who are either nascent entrepreneurs or owners-managers of a new business, using data from the Global Entrepreneurship Monitor (GEM). In addition, we also control for the effect of gross fixed capital formation, measured in per capita terms (Kpc_{it}), and the human capital (HK_{it}), given by the mean years of schooling. The coefficient α_i is a country-specific effect which captures time-invariant country characteristics, and u_{it} is the error term with the usual stationary properties. All variables are in the logarithmic form, except TEA which is expressed in percentage.

Table 1 provides a summary of the variable's definition, data sources and the respective descriptive statistics. We use an unbalanced panel dataset[2] composed by 37 OECD countries for the period 2000-2018. It is shown that the mean value of the human development index is 0.863 with a minimum value of 0.655 corresponding to Turkey and Colombia and the maximum 0.954 corresponding to Norway. The mean value of the total entrepreneurial activity is 8.46%, with the highest value of 27.35% found in Colombia (in 2016) and a minimum value of 1.5% in Japan, which reveals a large heterogeneity among the countries of the sample with regard to entrepreneurial activity. It should be said that less developed countries show higher values of entrepreneurial activity, but this is mostly necessity-driven rather than opportunity-driven entrepreneurship. Due to unfavorable

[2] Data on *TEA* are given for a smaller period and due to this the estimation approach uses 471 total observations.

economic conditions, high unemployment rates and lack of other opportunities, many people of these countries decide to create their own business to earn a sustainable income (for this argument, please see Stoica et al., 2020). The mean years of schooling is 11.2 with the lower value of 5.5 years found in Turkey and the highest of 14.1 years in Germany. The lowest capital stock per head is found in Colombia and the highest in Ireland.

Using the data described in Table 1, we estimate the development Equation (1) applying the most adequate method described by Arrelano and Bond (1991). To overcome endogeneity problems arising from the lagged dependent variable, the authors suggested the Generalized Method of Moments (GMM) approach, which consists in taking the first differences of variables and instrumenting the first differenced lagged values of the dependent variable by using previous lagged levels. The predetermined (lagged dependent variable) and other endogenous regressors in first differences are instrumented by suitable lags of their own levels. Arrelano and Bover (1996) and Blundell and Bond (1998), in a later work, suggested a modification of the original model, recommending the use of lagged levels and lagged differences as well. The GMM approach has one-step and two-step variants, the latter being asymptotically more efficient, since a finite-sample correction is made to the standard errors of coefficients, as indicated by Windmeijer (2005). The dynamic version of the development equation is estimated by using the GMM two-step difference system approach with robust standard errors and this approach is consistent with the partial adjustment mechanism.

Table 1: Variables, data sources and descriptive statistics

Variables	Definition	Source	Obs	Mean	SD	Min	Max
HDI	Human Development Index (0-1) a composite index measuring average achievement in three basic dimensions of human development - a long and healthy life, knowledge and a decent standard of living	United Nations (UN) http://hdr.undp.org/en/data	703	0.86299	0.05781	0.655	0.954
TEA	Total Entrepreneurial Activity (%) Percentage of population between 18 and 64 years who are either nascent entrepreneurs or owner-managers of a new business	Global Entrepreneurship Monitor (GEM) http://www.gemconsortium.org/data	471	8.4631	4.6635	1.48	27.35
Kpc	Gross Fixed Capital Formation per capita (million US dollars)	OECD Data https://data.oecd.org	703	0.0075	0.0035	0.0009	0.0257
HK	Human Capital Mean years of schooling	UN http://hdr.undp.org/en/data	703	11.2266	1.7166	5.5	14.1

4. Empirical findings

The results of estimating the development equation, as given in Equation (1), are shown in Table 2. The first point to highlight is that all variables' coefficients are statistically significant (at the 1% or 5% level), the second order autocorrelation indicates the absence of autocorrelated errors (at 5% of significance level), and the Hansen test validates the instruments used in the regression.

Table 2: Panel regression estimates

Method: Dynamic panel-data estimation, two-step difference GMM, robust standard errors Dependent variable: $lnHDI_{it}$					
Variable	Coefficient	Corrected Std. Error	t-ratio	p-value	
$lnHDI_{it-1}$	0.59564	0.05556	10.72	0.000	***

Method: Dynamic panel-data estimation, two-step difference GMM, robust standard errors Dependent variable: $lnHDI_{it}$					
Variable	Coefficient	Corrected Std. Error	t-ratio	p-value	
TEA_{it}	0.00071	0.00028	2.57	0.014	**
$lnKpc_{it}$	0.00750	0.00319	2.35	0.024	**
$lnHK_{it}$	0.11397	0.02669	4.27	0.000	***
Observations	393				
Groups	35				
AR (1)	z = -3.55 p-value = 0.000				
AR (2)	z = -1.79 p-value =0.074				
Hansen	$chi^2(131) = 34.51$ Prob > chi2 = 1.000				
Speed of adjustment	0.40436				

Notes: ***, ** denote statistical significance of coefficients at 1% and 5% levels, respectively. Robust standard errors according to Windmeijer (2005) correction are used. AR (1) and AR (2) are the Arellano-Bond tests for first and second order autocorrelation in first differences. The Hansen-test is used for testing over-identified restrictions (validating the instruments). The lagged dependent variable is assumed endogenous, instrumented by its own lagged values, the lagged values of all the other exogenous variables and the time trend variable.

Another relevant point to emphasise is that the lagged dependent variable is statistically significant at the highest 1% level, confirming therefore the hypothesis that past values of the development level (HDI) are important for determining its current levels. This evidence also ensures the appropriateness of the dynamic specification in comparison to a static model that ignores past history of development levels and estimates of the latter could be biased due to omission of relevant variables. The importance of estimating a dynamic model also lays on the fact that it allows to measure the speed of adjustment[3] between the actual variation of the development level and its desired level. The calculated value (see at the bottom of Table 2) shows that the adjustment process is not very fast, that is, approximately 40% of the actual variation in development is adjusted to its desired level within the same year.

The focus of our study is to examine the impact of entrepreneurship (given by TEA) on development level using a panel data of 37 OECD countries for the period 2000-2018. We observe that entrepreneurial activity has a positive and statistically significant effect on the level of development of the OECD countries. The regression results reveal that, in the short run, a one percentage point increase in entrepreneurial activity is associated with a 0.071% increase in the development level, everything else constant. In the long run, the expected effect is even higher, with an impact on the development level of 0.176%. Accordingly, entrepreneurship can be considered as an additional factor input generating higher economic development. As mentioned above, the increase of the entrepreneurial activity stimulates economic development by introducing innovative technologies, creating new products and services, promoting new business models, new jobs and employment opportunities, improving competition and competitiveness, all with positive social and economic benefits that boost the level of development of countries. This result is consistent with previous findings in the literature (Stoica et al., 2020, Ivanović-Djukić et al., 2018, Galindo and Méndez, 2014), suggesting that entrepreneurship has a positive impact on economic performance.

Regarding the other standard factor inputs (gross fixed capital formation and the human capital) the effects are the expected ones. It is shown that the increase in development level in the short-run is around 0.0075%, and in the log-run 0.019%, for every one percent increase in gross capital per head. This is the standard contribution of physical capital in the growth theory and therefore in economic development doctrine. We should clarify that gross capital is measured in per capita terms to take into consideration the population size of countries

[3]The partial adjustment mechanism is defined as:
$(HDI_{i,t}-HDI_{i,t-1})=\delta(HDI^*_{i,t}-HDI_{i,t-1})$ with $HDI^*_{i,t}$ the unknown desired level of development level and δ the adjustment coefficient. The left-hand side of this relation indicates the actual variation of the development level, and the right-hand side represents its desired variation. According to this relation, the speed of adjustment is given by subtracting from one the value of the estimated coefficient of the lagged dependent variable.

composing the sample. The impact of human capital on the development level is also positive and statically significant, revealing that a 1% increase in the average years of schooling, in the short-run, is responsible for 0.11% increase in the development level, while in the long-run is even higher and equivalent to 0.28% increase in economic development. According to the endogenous growth theory (Romer, 1986, Lucas, 1988, Barro, 2001), human capital defined as the skills, talent, and experience carried by the workforce of a country, is considered as the engine of growth and our empirical results offer additional evidence that education is the key factor for further development. This outcome is in line with previous empirical studies such as those found by Stoica et al. (2020), Acs et al. (2012) and Bosma et al. (2018).

5. Conclusions

This research investigates the importance of entrepreneurship on economic development, using a dynamic econometric model to carry out the empirical analysis on the OECD countries. We estimate the relationship between the country´s development level measured by the human development index (HDI), and entrepreneurship given by total early-stage entrepreneurial activity (TEA). The economic development equation also includes the standard factor inputs represented by the gross fixed capital formation per head and human capital, to be consistent with the endogenous growth theory.

The overall regression results are satisfactory in terms of statistical significance and sign expectations of the coefficients, confirming the predictions of the endogenous growth theory. In particular, our empirical findings sustain a positive and statistically significant relationship between entrepreneurship and the economic development level, in the short and long run perspectives, showing that entrepreneurship can be seen as an additional factor input in the countries' economic development pathway. The expected positive effect is also observed regarding the standard factor inputs represented by human and physical capital. Policymakers should therefore consider these positive effects when designing economic policies. Recognizing the importance of entrepreneurship as a contributing factor to economic development it is crucial that policymakers prioritize entrepreneur-friendly ecosystems to drive innovative new businesses, trade, and investment.

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